

NASA TT F-11,902

PULMONARY SCINTIGRAPHY IN LUNG EDEMA

H. Rossler, Zurich

Translation of "Lungenszintigraphie bei Lungenembolie" from
Schweizerische Medizinische Wochenschrift No. 23, Vol. 98, p. 873,
1968.

FACILITY FORM 602

N 68-34802
(ACCESSION NUMBER) (THRU)
3
(PAGES) (CODE)
/ 04
(NASA CR OR TMX OR AD NUMBER) (CATEGORY)

GPO PRICE \$ _____

CSFTI PRICE(S) \$ _____

Hard copy (HC) _

Microfiche (MF) _

ff 653 July 65



PULMONARY SCINTIGRAPHY IN LUNG EDEMA

H. Rossler, Zurich

The lung can be scintigraphically examined. 1. After inhaling substances labeled radioactive ("Inhalation Scintigram") and 2. for the examination of a microembolization in the area of the capillary branching of the A. pulmonalis after injecting denatured human albumin labeled ^{131}I (vascular or "perfusion scintigram").

The vascular scintigram is diagnostically more important. The distribution of the injected substances acts proportionally to the relative blood flow in the A. pulmonalis within the individual lung segments. Pathological changes of the lung with the regionally disturbed blood supply is shown scintigraphically as cold zones within the lungs whose function is normally homogeneous. The obliteration of a vessel according to its extent and topography can be observed immediately after the thromboembolic episode. Roentgenologically, the resulting infarct is registered 24 hours later, i.e., too late in most cases for therapeutic measures or even for differential-diagnostic clarifications. On the other hand, structural changes of the lung artery can be angiographically demonstrated.

Both methods were simultaneously applied during a study involving 73 patients of the Baylor University College of Medicine and of the Ben Taub General Hospital in Houston, Texas. The following changes were found in a group of 27 thromboembolic cases (24 acute and 3 chronic cases): arteriographically complete and incomplete obstructions in various branchings of the lung artery; intravasal sockets in the median contrast column; decreased volume of the affected lung segments; vessel caliber fluctuations or combinations of these changes. In 22 cases the lung scintigram indicated clearly a reduced activity in the corresponding regions. The lung scintigrams of 4 additional patients with angiographically multiple and bilateral disorders showed for the most part unilateral findings. The contra-lateral findings were so limited that they were misinterpreted. A single case with a peripheral obstruction in the segmental artery within the area of the left lower lobe was scintigraphically diagnosed as normal. Even with today's technique, misinterpretations concerning the basal segments, which are subjected to increased displacement by breathing, cannot always be avoided. The majority of patients with other pulmonary ailments also had abnormal scintigrams. Among them, patients with bronchial carcinoma or with lung fibrosis showed disproportionately extended cold zones. The authors stress that emphysema bubbles and also a symmetrically reduced blood supply in both the lower lobe regions near the heart during the left decompensation, such as the reduced blood supply at the base of the left lung, which is usually found when cardiac insufficiency occurs, might erroneously be diagnosed as embolisms. On the other hand, however, selective pulmonary

arteriography fails to indicate microembolisms. This procedure is not free from side-effects either. Two patients died within 30 minutes after the examination, and another patient had heart chamber fibrillations immediately after the injection of the contrast medium; the fibrillation could later be corrected.

The following conclusions were reached for medical practice: Scintigraphic findings are adequately safe for instituting anticoagulation therapy, or for a ligature of the V. cava. But a pulmonary embolectomy should not be undertaken without positive evidence of embolism in the angiogram, which can, if necessary, be obtained during the operation.

References

H.L. Fred and colleagues: Arteriographic assessment of lung in the diagnosis of pulmonary thromboembolism. New Engl. J. Med. 275, 1025 (1966).